

using a first spreading code group and a second spreading code group, said first spreading code group being common to respective base stations and having a period equal to an information symbol period, and said second spreading code group being different from base station to base station and having a period longer than the information symbol period; and

masking, when transmitting a signal which is doubly spread using a first spreading code in said first spreading code group and a second spreading code in said second spreading code group, said second spreading code for M symbols at fixed intervals, where M is a natural number equal to or greater than one.

2. A transmitter in a mobile communication system comprising:

first code spreading means for spreading signals of all channels using first spreading codes which belong to a first spreading code group and differ from one another, said first spreading code group being common to respective base stations and having a period equal to an information symbol period;

second code spreading means for spreading for M symbols one or more spread signals fed from said first code spreading means using a third spreading code, where M is a natural number equal to or greater than one, said third spreading code being a complex conjugate of a second spreading code which differs from base station to base station and has a period longer than the information symbol period;

adding means for adding at appropriate timings a signal on a channel spread by said first code spreading means and signals of one or more channels spread by said second code spreading means; and

third code spreading means for spreading by using said second spreading code the signals of the channels output from said adding means.

3. A receiver in a mobile communication system comprising:

first synchronization detecting means for detecting a synchronized time of a first spreading code from a detection time of a correlation output value, said correlation output value being obtained through a correlation detection processing between a spreading modulation signal obtained by receiving a signal transmitted by a transmitter and a first spreading code in a first spreading code group; and

second synchronization detection means for performing correlation detection sequentially using codes obtained by multiplying said first spreading code by A (A is a natural number) second spreading codes in a second spreading code group, and for deciding a second spreading code having a maximum correlation value, wherein said correlation detection is started from a time position at which a maximum correlation value is detected by said first synchronization detection means.

4. A receiver of a mobile communication system comprising:

first spreading code synchronized phase memory means for storing B dominant time positions in descending order of magnitude of correlation values detected by first synchronization means;

second spreading code synchronization detecting means for performing correlation operations sequentially between a received signal and codes obtained by multiplying a first spreading code by B spreading codes in the second spreading codes of contiguous base stations

of a current base station of which the current base station notifies, wherein said correlation operations are started from time positions stored in said first spreading code synchronization memory means, and are carried out in descending order of magnitude of the correlation values stored in said first spreading code synchronization memory means; and

means for detecting which codes of the second spreading codes correspond to the B dominant time positions of the first spreading codes.

5. A spreading code synchronization method comprising the steps of:

performing correlation detection between a received spread modulation signal and codes obtained by multiplying a first spreading code by second spreading codes of the second spreading code group, wherein said correlation detection is started from a time position at which a maximum correlation output signal is obtained in correlation detection between the first spreading code and the received spread modulation signal obtained by receiving a signal transmitted by a transmitter; and

deciding, after carrying out the correlation detection between the received spread modulation signal and the codes obtained by multiplying the first spreading code by the second spreading codes, the second spreading code by giving a maximum correlation value as the second spreading code used for spreading the received spread modulation signal.

6. The spreading code synchronization method as claimed in claim 5, wherein a searching is continued until the maximum correlation value between the received spread modulation signal and the codes obtained by multiplying the first spreading code by the second spreading codes exceeds a predetermined threshold value T.

7. The spreading code synchronization method as claimed in claim 6, wherein the threshold value T is determined depending on the maximum correlation detection value between the received spread modulation signal and the first spreading code.

8. A receiver comprising:

first spreading code synchronized phase memory means; and

received level detection means for detecting received signal power by generating delay profiles of multipaths for each base stations by detecting correlations between a received spread modulation signal and codes obtained by multiplying a first spreading code by second spreading codes of a current base station and continuous base stations in a particular time range around a time position of said first spreading code synchronized phase memory means,

wherein said received level detecting means carries out, in a second and following searches, a search around a time position of a path obtained by a previous search.

9. The receiver as claimed in claim 8, wherein said received level detecting means suppresses a searching at symbol positions spread by only the first spreading code when a frame structure is used which includes portions spread by only the first spreading code for one or more symbols.

10. A spreading code synchronization method comprising: a first synchronization detection step of performing correlation detection processing between a spread modulation signal obtained by receiving a signal transmitted by a transmitter and a first spreading code of a first